



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,660	07/02/2003	Bo Su Chen	15436.441.3	5518

22913 7590 08/10/2007
WORKMAN NYDEGGER
(F/K/A WORKMAN NYDEGGER & SEELEY)
60 EAST SOUTH TEMPLE
1000 EAGLE GATE TOWER
SALT LAKE CITY, UT 84111

EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT	PAPER NUMBER
----------	--------------

2874

MAIL DATE	DELIVERY MODE
-----------	---------------

08/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/612,660

Applicant(s)

CHEN ET AL.

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-31 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8, 10-18, 21-25, 32-40 and 42 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 9 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 2, 2007 has been entered.

Response to Amendment

Applicant's Amendment filed July 2, 2007 has been fully considered and entered.

The indicated allowability of claims 2-4, 6, 8 and 10-16 is withdrawn in view of the newly discovered reference(s) to Schunk (US 2003/0053769 A1) and Yoon et al. (US 2003/0108296 A1). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Schunk (US 2003/0053769 A1).

Regarding claim 1; Schunk discloses an optical coupler comprising:

- a spherical lens (31; see paragraph 49); and

Art Unit: 2874

- an aspherical lens (5; see paragraph 45) configured to directly contact and optical fiber (41);
- wherein the lenses are situation in the same optical path.

Regarding claims 21 and 22; Schunk discloses a coupling means comprising:

- a means for spherically focusing light (31) from a light source (3, laser; see paragraph 42); and
- means for aspherically focusing light (5) from the means for spherically focusing light; and
- an optical medium (41, optical fiber) configured to guide the aspherically focused light from said means for aspherically focusing light, the optical medium (41) contacting the means for aspherically focusing light (5).

Claims 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Koops (US 2002/0009259 A1).

Regarding claim 32; Koops discloses and optical coupler comprising:

- an aspherical lens (2) on an optical axis; and
- a spherical lens (9) on an optical axis;
- wherein the aspherical lens (2) is immediately preceding or following an optoelectronic element (laser);
- wherein the spherical lens (9) is immediately preceding or following an optical medium (optical fiber having core, 6, and cladding, 7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al. (US 2003/0108296 A1).

Regarding claim 1; Figure 1 of Yoon et al. discloses an optical coupler comprising:

- a second lens (5) ; and
- a first lens (1b) configured to directly contact an optical fiber (1a);
- wherein the lenses are situated in the same optical path.

In paragraph 36, Yoon et al. teaches that the first lens (1b) may be an aspherical lens. In paragraph 34, Yoon et al. teaches that the second lens (5) is a converging lens, and in paragraphs 11 and 13, Yoon et al. teaches that a spherical lens is used to form a second converging lens (15) of a prior art embodiment. Given the explicit suggestion of Yoon et al. that the first lens (1b) may be an aspherical lens, one of ordinary skill in the art would have found it obvious to have the first lens be an aspherical lens.

Furthermore, given the disclosure of Yoon et al., one of ordinary skill in the art would have found it obvious to have the second converging lens (5) be a spherical lens.

Claims 2-4, 6, 8, 10-18, 23-25 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schunk (US 2003/0053769 A1).

Regarding claims 2-4, 17 and 18; Schunk discloses that the aspheric lens (5) may be glass or plastic (see paragraph 44). Given the explicit suggestion by Schunk that the aspheric lens may be plastic and the knowledge generally available to one of ordinary skill in the art, that aspheric lenses may be easily formed by molding plastic material to provide improved mechanical consistency, lower component manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements (in this case lenses) in optical systems, one of ordinary skill in the art would have found it obvious to form the aspheric lens (5) disclosed by Schunk from plastic.

Schunk does not explicitly state that the spherical lens is a ball lens, however, ball lenses are well known, commonly used spherical lenses. One of ordinary skill in the art would have found it obvious to incorporate any well known, commonly used spherical lens in the invention of Schunk, since Schunk does not disclose that a particular spherical lens is employed in the invention, including ball lenses, since such lenses are readily available and commonly used in the art, and since it appears that the invention would perform equally well with a ball lens. It is noted that the selection of a ball lens, which is a spherical lens that is equivalent to other spherical lenses, would be within the level of ordinary skill in the art.

Schunk does not explicitly state that the spherical lens is formed of glass. However, ball or spherical lenses are simple shapes that are easily and commonly made from glass materials, which exhibit well known standard properties, and

Art Unit: 2874

advantageously have improved heat tolerances and offer higher refractive index values, when compared to plastics. Thus, one of ordinary skill in the art would have found it obvious to use a glass spherical lens in the invention of Schunk as the disclosed converging lens (5), since glass spherical lenses are commonly used and readily available and offer known advantages. It is noted that both glass spherical lenses and plastic aspherical lenses are well known, commonly used, and readily available in the art. It has also been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 6; the aspherical lens is approximately convex.

Regarding claims 8 and 10; It would have been obvious to one of ordinary skill in the art to form the aspheric lens of plastic, as discussed above with respect to claims 2-4. It is noted that the limitations "molded" and "injection molded" are product-by-process limitations and are not given patentable weight in a product claim. However, it is generally known that an advantage to forming lenses of plastic material is that the lenses can be easily manufactured with a molding process.

Regarding claims 11 and 12; a light source (transmitter, 3) is situation proximate to the spherical lens (31) and an optical medium (fiber, 41) is situation proximate to the aspherical lens (5), wherein light may propagate from the light source through the spherical lens and aspherical lens, respectively.

Regarding claims 13-15; The laser source may be a VCSEL, as taught by Schunk, and the optical medium is an optical fiber. Schunk discloses all of the

limitations of claim 13, except for the a window being situated between the light sources (VCSEL, 3) and the spherical lens (31). VCSELs are commonly packaged in TO-cans having windows in the top portion so that light from the VCSEL may be transmitted, while allowed the VCSEL to be sufficiently protected from the outside environment to prevent damage to the VCSEL (for example only of a well known TO-can/VCSEL package with a window, please refer to Figure 1 of Burmeister, US 2002/0126963 A1). One of ordinary skill in the art would have found it obvious to incorporate a VCSEL packaged in a TO-can with a window in the top surface thereof in the invention of Schunk, since such VCSELs are well known and provide environmental stability for the VCSEL contained therein, thereby providing a window located between the lens (31) and the VCSEL (3).

Regarding claims 16 and 23; Schunk discloses that the laser (3) may be a VCSEL (see paragraph 42). Schunk does not disclose that the optical fiber is a single-mode optical fiber. However, one of ordinary skill in the art would have found it obvious to use any desired optical fiber in the invention of Schunk, including a single-mode optical fiber in order to obtain the desired transmission properties for an optical system, since single-mode optical fibers are well known and commonly used in optical systems in the art.

Regarding claim 24; Schunk does not explicitly state that the means for spherically focusing light conveys more light power than the means for aspherically focusing light, however, since the means for focusing light is positioned closer to the light source (3) than the means for aspherically focusing light, and optical power is

Art Unit: 2874

known to decrease with distance from a light source, it is inherent that the spherical lens with focus more light power of the light from the light source than the aspherical lens.

Regarding claim 25; the limitations of claim 25 are suggested by the Schunk reference, as discussed with respect to claims 2-4 above.

Regarding claim 42; the aspherical lens (5) includes a substantially flat portion that is configured to directly contact the optical fiber (41).

Claims 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koops (US 2002/0009259 A1).

Regarding claims 33 and 34; Koops does not explicitly state that the aspherical lens is plastic or that the spherical lens is glass. Given the knowledge generally available to one of ordinary skill in the art that aspheric lenses may be easily formed by molding plastic material to provide improved mechanical consistency, lower component manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements (in this case lenses) in optical systems, one of ordinary skill in the art would have found it obvious to form the aspheric lens (5) from plastic.

Koops does not explicitly state that the spherical lens is a ball lens, however, ball lenses are well known, commonly used spherical lenses. One of ordinary skill in the art would have found it obvious to incorporate any well known, commonly used spherical lens in the invention of Koops, including ball lenses, since such lenses are readily available and commonly used in the art, and since it appears that the invention would

Art Unit: 2874

perform equally well with a ball lens. It is noted that the selection of a ball lens, which is a spherical lens that is equivalent to other spherical lenses, would be within the level of ordinary skill in the art.

Koops does not explicitly state that the spherical lens is formed of glass. However, ball or spherical lenses are simple shapes that are easily and commonly made from glass materials, which exhibit well known standard properties, and advantageously have improved heat tolerances and offer higher refractive index values, when compared to plastics. Thus, one of ordinary skill in the art would have found it obvious to use a glass spherical lens in the invention of Koops, since glass spherical lenses are commonly used and readily available and offer known advantages. It is noted that both glass spherical lenses and plastic aspherical lenses are well known, commonly used, and readily available in the art. It has also been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 35 and 36; the light source is a laser and the optical medium is an optical fiber.

Regarding claims 37 and 39; Koops does not explicitly state what type of laser or optical fiber is employed in the invention. One of ordinary skill in the art would have found it obvious to use any known lasers, including VCSELs, and any known optical fiber, including single-mode optical fibers, to obtain the desired transmission properties and to incorporate well known, commonly used and readily available elements in the invention of Koops, since it appears that the invention would perform equally well

Art Unit: 2874

regardless, since Koops has not disclosed that a particular laser or fiber is used, and since both VCSELs and single-mode optical fibers are well known, commonly used and readily available in the art.

Regarding claim 38; Koops does not disclose that the optoelectronic element is a detector. However, it is generally known in the art that light may be coupled from an optical fiber to a detector via lens systems, and that this is easily accomplished by replacing an optical transmitter with a detector for the purpose of transmitting light in the opposite direction to receive an optical signal with efficient coupling from the optical fiber.

Regarding claim 40; Koops does not explicitly state what type of optical fiber is employed in the invention. One of ordinary skill in the art would have found it obvious to use any known fiber, including a multi-mode optical fiber, to obtain the desired transmission properties and to incorporate well known, commonly used and readily available elements in the invention of Koops, since it appears that the invention would perform equally well regardless, since Koops has not disclosed that a particular fiber is used, and since multi-mode optical fibers are well known, commonly used and readily available in the art.

Allowable Subject Matter

Claims 5, 7, 9 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 26-31 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The known prior art does not disclose or reasonably suggest a method for coupling light, as defined in claim 26, comprising spherically focusing light from a light source resulting in a first portion of light having a first focal point on an optical axis and a second portion of light having a second focal point on an optical axis in combination with aspherically focusing the first portion of the light and the second portion of the light resulting in the first and second portions of light having a common focal point at a point of contact between an aspherical lens and an optical medium; or a coupler, as defined in claim 5, wherein the aspherical lens is approximately concave in combination with the limitations of the base and intervening claims. Claims 7, 9 and 41 depend from claim 5; and claims 27-31 depend from claim 26.

Response to Arguments

Applicant's arguments with respect to rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2874

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

A handwritten signature in black ink, appearing to read "MRCushwa".

Michelle R. Connelly-Cushwa
Patent Examiner
August 5, 2007